

REMARKS

The Official Action mailed January 3, 2006, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the consideration of the Information Disclosure Statements filed on November 26, 2003; January 8, 2004; January 20, 2004; February 3, 2004; and September 29, 2005. A *Correction to Previously Submitted Information Disclosure Statement* is submitted herewith and consideration is respectfully requested.

Claims 1-54 were pending in the present application prior to the above amendment. Dependent claims 3, 12, 21, 30, 39 and 48 have been canceled and incorporated into independent claims 1, 10, 19, 28, 37 and 46, respectively. Accordingly, claims 1, 2, 4-11, 13-20, 22-29, 31-38, 40-47 and 49-54 are now pending in the present application, of which claims 1, 10, 19, 28, 37 and 46 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

The Official Action rejects claims 1, 10, 19, 28, 37 and 46 as obvious based on the combination of U.S. Patent No. 6,700,096 to Yamazaki et al. and U.S. Patent No. 6,242,292 to Yamazaki et al. The Applicant respectfully traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the

teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims.

Independent claims 1, 10, 19, 28, 37 and 46 have been amended to recite that a spot of a first pulsed laser beam and a spot of a second continuous wave laser beam, the second continuous wave laser beam having a wavelength of a fundamental wave, are overlapped. A semiconductor film is melted by irradiating a first laser beam thereby increasing an absorption coefficient of the fundamental wave. Therefore, the overlapped laser beam spots more effectively absorb a second laser beam having a fundamental wave in the semiconductor film. These features are supported in the present specification, for example, at least at page 7, line 33 to page 8, line 7. The Applicant respectfully submits that Yamazaki '096 and Yamazaki '292 do not teach or suggest the above-referenced features of the present independent claims.

Also, the Official Action asserts that "Yamazaki et al. ('096) discloses the laser annealing of semiconductor materials using a dual or plurality of lasers ... [and the] beam spots of the lasers overlap each other on the object to be processed" (page 2, Paper No. 20051227). While the Official Action concedes that Yamazaki '096 "does not teach the exact order of operations or absorption" (Id.), the Official Action asserts that Yamazaki '292 cures these deficiencies in Yamazaki '096. The Official Action asserts that Yamazaki '292 discloses the following: "producing a semiconductor device using

laser beams to anneal and crystallize the substrate. Preliminary irradiation is conducted because the absorptance of laser energy is different for single crystal and polycrystalline materials. Thus amorphous silicon is transformed and then the entire substrate is subjected to annealing. ... The irradiation is a two stage process and there is overlap of the two laser beams" (*Id.*, emphasis added). However, the Official Action fails to address the claimed feature that a beam spot of a second continuous wave laser beam is overlapped with a beam spot of a first pulsed laser beam, and the Applicant respectfully submits that Yamazaki '096 and Yamazaki '292 do not teach or suggest the above-referenced features of the present independent claims.

Since Yamazaki '096 and Yamazaki '292 do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

The Official Action rejects claims 1, 10, 19, 28, 37 and 46 as obvious based on the combination of JP 04-124813 to Ogawa et al., Yamazaki '292 and EP 1 049 144 to Taketomi et al. Although the Official Action states that claims 2, 3, 6, 7, 11, 12, 15, 16, 20, 21, 29, 30, 33, 34, 38, 39, 42, 43, 47, 48, 51 and 52 are rejected as obvious based on the combination of Ogawa, Yamazaki '292 and U.S. Patent No. 5,953,597 to Kusumoto et al. (page 5, *Id.*) and that claims 4, 5, 13, 14, 22-25, 31, 32, 40, 41, 49 and 50 are rejected as obvious based on the combination of Ogawa, Yamazaki '292 and U.S. Patent No. 6,156,997 to Yamazaki et al. (*Id.*), due to the rejection of the independent claims on the basis of the combination of Ogawa, Yamazaki '292 and Taketomi, it appears that the Official Action rejects the above-referenced dependent claims on the basis of the combination of Ogawa, Yamazaki '292, Taketomi, and Kusumoto or Yamazaki '997. The Applicant respectfully submits that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present application, as amended.

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended. Independent claims 1, 10, 19, 28, 37 and 46 have been amended to incorporate the features of dependent claims 3, 12, 21, 30, 39 and 48, respectively. That is, the independent claims have been amended to recite that a second laser beam has a wavelength of a fundamental wave. Also, as noted above, the independent claims recite that a beam spot of a second continuous wave laser beam is overlapped with a beam spot of a first pulsed laser beam. For the reasons provided below, Ogawa, Yamazaki '292, Taketomi, Kusumoto and Yamazaki '997, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

The Official Action asserts that "Ogawa et al. discloses method and apparatus for manufacturing a semiconductor device ... irradiated with continuous wave and pulsed lasers" (page 3, Id.). Please incorporate the arguments above with respect to the teachings and deficiencies of Yamazaki '292. The Official Action asserts that "Taketomi et al. discloses the overlap of beam spots as they are scanned over a substrate" (page 4, Id.). However, Ogawa, Yamazaki '292 and Taketomi do not teach or suggest that a beam spot of a second continuous wave laser beam is overlapped with a beam spot of a first pulsed laser beam. Although Taketomi appears to teach in Example 5-9 that the laser beam 571a emitted from the KrF excimer laser 571 is applied to a belt-like shaped region 571b to be irradiated and the laser beam 591a from the YAG laser system 591 is applied to the region 591b to be irradiated, this YAG laser is converted into a beam having a half of the wavelength by using a KTP crystal before being applied to the region 591b to be irradiated. Since the continuous wave laser beam of the present independent claims have the wavelength of a fundamental wave, the Applicant respectfully submits that the continuous wave laser beam of the present claims is different from the YAG laser of Taketomi.

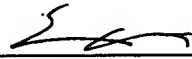
Kusumoto and Yamazaki '997 do not cure the deficiencies in Ogawa, Yamazaki '292 and Taketomi. The Official Action relies on Kusumoto to allegedly teach the use of

various lasers and different harmonics (page 5, Id.) and on Yamazaki '997 to allegedly teach the formation of a semiconductor device with overlapped beams that may be square or rectangular. However, Ogawa, Yamazaki '292, Taketomi, Kusumoto and Yamazaki '997, either alone or in combination, do not teach or suggest that a beam spot of a second continuous wave laser beam is overlapped with a beam spot of a first pulsed laser beam. As noted above, on Ogawa, the YAG laser is converted into a beam having a half of the wavelength by using a KTP crystal before being applied to the region 591b to be irradiated. The mere disclosure of a KrF, XeCl or Nd:YAG laser with a fundamental wavelength in Kusumoto is not sufficient to teach that the YAG laser in Ogawa should not be converted into a beam having a half of the wavelength by using a KTP crystal before being applied to the region 591b to be irradiated. Also, the mere disclosure of the formation of a semiconductor device with overlapped beams that may be square or rectangular in Yamazaki '997 does not teach or suggest or that a beam spot of a second continuous wave laser beam should be overlapped with a beam spot of a first pulsed laser beam.

Since Ogawa, Yamazaki '292, Taketomi, Kusumoto and Yamazaki '997 do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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